Pendulum Pal

Kit contains:

- 2 giraffe templates
- 2 shrub templates
- 1 paper straw
- 2 pennies
- 1 cardboard gear
- 1 plastic cup with slot in bottom
- 2 plastic straw pieces
- 1 toothpick
- 1 glue dot

You will need: scissors, a pin for poking, and glue/tape.

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INSTRUCTIONS

Step 1. Use a pin to poke a hole through the middle of the paper straw. Push the toothpick through the hole. This will be the pivot point of your pendulum.

Step 2. Slide the straw pieces onto the sticky-outy ends of the toothpick. Tape or glue then down to the cardboard gear. Your paper straw should swing freely.

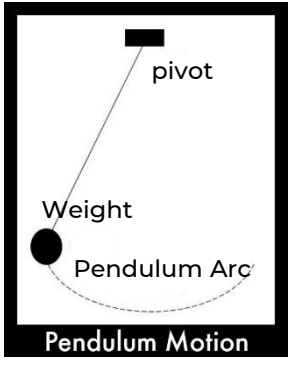
Step 3. Cut your glue dot in half. Peel off the backings and use it to stick your pennies to the bottom of the straw, one on either side. This weight is the bob of your pendulum.

Step 4. Place your cup bottom-side up. Insert the bob end of your mechanism through the pre-cut slot, resting the cardboard gear on top. Tape or glue in place.

Step 5. Cut out the giraffes and shrubs. Fold the shrubs tabs along the dotted lines.

Step 6. Glue or tape the giraffes to the top of the paper straw and the shrubs to the top of the gear, straddling the plastic straw pieces.

Give your giraffe a nudge and watch your pendulum pal rock and roll!



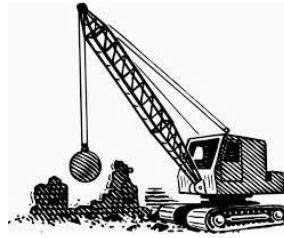
THE SCIENCE:

A **pendulum** is a weight hung from a **pivot point** and allowed to swing freely until friction between the weight and the air slows and stops the swinging of the pendulum and it eventually comes to a stop. The weight on a pendulum is also called a **bob**. (This is a funnier name.)

Project inspired by: robives.com/project/pendulum/

HOW DO PENDULUMS WORK?

Pendulums work because of the energy involved in their systems. When the pendulum weight is raised, it contains **gravitational potential energy**. This is the energy stored by the weight because of its position above the ground. When the weight is released, that potential energy is converted into **kinetic energy**, the energy of motion.



As gravity pulls the weight down toward earth, both the kinetic energy and **velocity**, or speed, of the weight increase until the weight reaches the bottom point of the **pendulum arc**. This is the point of highest kinetic energy and velocity. After the weight passes the bottom of the arc, these both decrease until the weight stops at the top of the arc at opposite point of the release.

At this point, the kinetic energy is back to zero and the weight now contains gravitational potential energy again. The weight only stops for an instant until gravity pulls the weight back down and the process starts again.